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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/672,149 | 09/26/2003 | Selena Chan | 070702007620 | 6083 |
| 7590 | 01/30/2007 | | EXAMINER | |
| Raj S. Dave Morrison & Foerster LLP 1650 Tysons Blvd., Suite 300 McLean, VA 22102 | | | WILDER, CYNTHIA B | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 1637 | |
| SHORTENED STATUTORY PERIOD OF RESPONSE | MAIL DATE | DELIVERY MODE | | |
| 3 MONTHS | 01/30/2007 | PAPER | | |

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

| | | |
|------------------------------|--------------------------|---------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 10/672,149 | CHAN ET AL. |
| | Examiner | Art Unit |
| | Cynthia B. Wilder, Ph.D. | 1637 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 18 December 2005.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 26-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 26-34 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____. | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| | 6) <input type="checkbox"/> Other: _____. |

DETAILED ACTION

1. Applicant's amendment filed December 18, 2006 is acknowledged and has been entered. Claim 34 has been amended. Claims 26-34 are pending. All of the arguments have been thoroughly reviewed and considered but are deemed moot in view of the new grounds of rejections presented in this Office Action. Accordingly, finality of the instant invention is withdrawn. Any rejection not reiterated in this action has been withdrawn as being obviated by the amendment of the claims.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

New Grounds of Rejections

Claim Interpretation

The instant invention does not provide a limiting definition for the term "affixed within the channel" in relations to the nanoparticle aggregates. The courts have established that during patent examination the pending claims must be interpreted as broadly as their terms reasonably allow (*In re Zletz*, 893 F.2d 321-22, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989). According, the term "affixed within the second channel" can be interpreted as two nanoparticles being affixed or attached to each other within a channel, a nanoparticle being affixed to a surface of a channel via a linker or a nanoparticle being attached to a label or sample that is affixed within a channel.

Claim Rejections - 35 USC § 102(e)

9. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

Art Unit: 1637

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

10. Claims 26, 27 and 29-34 are rejected under 35 U.S.C. 102(e) as being anticipated by Su et al (Pub No. US 2003/0186240 A1, October 2, 2003, filing date March 14, 2002).

The applied reference has a common inventor with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

Regarding claim 26, Su et al teach an apparatus comprising: a reaction chamber, a first channel in fluid communication with the reaction chamber, a second channel in fluid communications with the first channel; a multiplicity of nanoparticles affixed with the second channel and a Raman detector operably coupled to the nanoparticle packed channel (see figure 2 and paragraphs 0068 to 0077).

Regarding claim 27, Su et al teach the apparatus of claim 26, wherein the apparatus is capable of detecting single nucleotide molecules (see paragraph 0070).

Regarding claim 29 and 30, Su et al teach the apparatus of claim 26, wherein the first channel is a microfluidic channel and the second channel is a nanochannel or microchannel (see figure 2 and paragraphs 0068-0077).

Regarding claims 31 and 32, Su et al teach the apparatus of claim 26, wherein the portion of nanoparticle aggregates comprises between two to six nanoparticles per aggregate (0016 and 0041-0045).

Regarding claim 33, Su et al teach the apparatus of claim 31, wherein nanoparticles comprising the aggregates comprise gold and/or silver and the nanoparticles are between about 1 nm and 2 μ m in size (0016, 0041, 0042 and 0045).

Regarding claim 34, Su et al teach the apparatus of claim 26, wherein the plurality of cross-linked nanoparticle aggregates affixed within the second channel are throughout a cross-sectional area of the second channel and the Raman detector is adapted to detect said Raman signal (see Figure 2 and (0045, 0074 and 0105). Therefore, Su et al meet the limitations of the claims recited above.

Claim Rejections - 35 USC § 103

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

Art Unit: 1637

invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

14. Claims 26-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shipwash (2002/0058273 A1, effective filing date August 10, 2000) in view of Shipway et al. {Shipway, herein} (Chemphyschem., vol. 1, pages 18-52, August 2000). Regarding claim 26, Shipwash teaches an apparatus comprising a reaction chamber a first channel in fluid communication with the reaction chamber; a second channel in fluid communication with the first channel; a multiplicity of nanoparticles affixed in the second channel and a detector coupled to the nanoparticle packed channel, wherein said detector is a Raman detector (figure 14 and paragraphs (see paragraphs 0066, 0167, 0174, 0189, 0270, 0395, 0425, Example 15).

Shipwash does not expressly teach wherein the multiplicities of nanoparticles are a plurality of cross-linked nanoparticles aggregates.

Shipway et al provides a review of nanoparticles arrays on surfaces. Shipway teaches that nanoparticles can be constructed from any charged nanoparticle and an oppositely charged "crosslinker" in an analogous way to the construction of colloid-polymer architectures. Shipway teaches that the "crosslinker" may be anything from a small molecule to another nanoparticle from a small molecule to another nanoparticle (page 26, first paragraph under the section 2.3.2 in column 1). Shipway teaches when an adsorbate on a rough metal surface is subject to Raman Scattering spectroscopy, very high enhancements over a flat surface are observed. Shipway teaches that plasmon resonances of nanoparticles aggregates provide an even better excitation frequency for surfaced enhanced Raman scattering. Shipway teaches that there are problems with aggregating nanoparticles in solution; however, Shipway teaches ways to stabilize colloid

aggregates in solution. Shipway teaches that nanoparticles can be immobilized so their aggregation state can be carefully controlled. Shipway teaches surface enhanced Raman scattering activity is strongly dependent on the aggregation state of the particle (page 36 and 37, section 4.1.2. and Figure 18).

In view of the foregoing, one of ordinary skill in the art at the time of the claimed invention would have been motivated to provide nanoparticle aggregates affixed within the channel of the apparatus of Shipwash for the benefit of enhancing the excitation frequency for surfaced enhanced Raman scattering as suggested by Shipway.

Regarding claim 27, Shipwash teaches the apparatus of claim 26, wherein the apparatus is capable of detecting single nucleotide (0254 and 0255).

Regarding claim 28, Shipwash teaches the apparatus of claim 26, wherein further comprising electrodes (paragraph 0529).

Regarding claim 29 and 30, Shipwash teaches the apparatus of claim 26, wherein the first channel is a microfluidic channel and the second channel is a nanochannel or microchannel (see figure 14 and paragraph 0210 and 0425).

Regarding claim 31 and 32, Shipway teaches wherein the aggregates comprises at least 2 to 4 nanoparticles(see Figure 18 and legend).

Regarding claim 33, Shipway teaches wherein the nanoparticles comprising the aggregates are silver and are about 35 nm in diameter (see page 37, col. 1, first full paragraph and Figure 18).

Regarding claim 34, Shipwash teaches the apparatus of claim 26, wherein the plurality of cross-linked nanoparticles affixed within the second channel are throughout a cross sectional

area of the second channel and the Raman detector is adapted to detect said Raman signal (Figure 14).

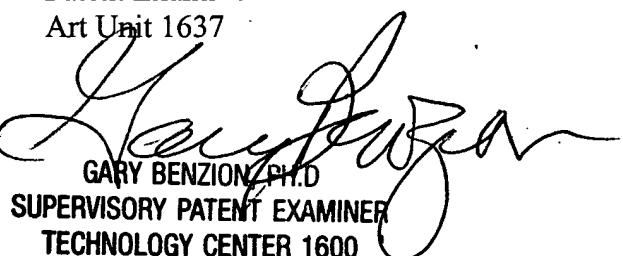
Conclusion

15. No claims are allowed. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Cynthia B. Wilder, Ph.D. whose telephone number is (571) 272-0791. The examiner can normally be reached on a flexible schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (571) 272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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